Freshwater Biological Association

FBA Translation (New Series) No. 153

Title: Influence of aniline on *Daphnia magna* Straus.

Author(s) Lakhnova V.A.

Reference: Trudy Saratov. Otd. GOSNIORKH, 13, 102-104

Original language: Russian

Date of publication of original: 1975

Translator: J.E.M. Horne

Date of publication of translation: 1982

Number of pages of translation: 2pp

F.B.A. Translation (N.S.) No.153

Lakhnova V.A. (1975). Influence of aniline on Daphnia magna Straus.

Trudy Saratov. Otd. GOSNIORKH, 13, 102-104

Translated by J.E.M. Horne

Experiments were carried out by the method of direct effect of the tested substance on increase of biomass (1,2). D. magna was cultured under laboratory conditions. The temperature during the experiments varied from 17 to 20°C.

For testing the effect of aniline on survival of individuals a series of critical experiments was set up with concentration of the given preparations in mg/l: 5000, 2500, 1000, 500, 400, 300, 200, 100, 50, 25 and control. The experiments were conducted with 10% solution of aniline.

In the case of poisoning by a large dose of aniline even only for 3-5 min. in daphnia we observed isolated twitchings of the whole body, coordination of movement was upset, indicating the effect of the preparation on the nervous system. In all experimental doses the total death of the organisms was observed in the course of a single day.

A second series of critical experiments was carried out with concentrations in mg/l: 10, 8, 6, 4, 2, 1, 0.8, 0.6, 0.4, 0.2, 0.1 and control. The given doses of aniline appeared likewise acutely lethal. In the first three concentrations (10, 8, 6 mg/l.) death of 50% of daphnia took place during single days. The organisms remaining alive on the following day were sluggish and stiff. Total death of the organisms took place in 2.5 days. In the remaining concentrations the daphnia lived until the end of the experiment, but in the organisms we observed peeling of the shell, protruding of the internal organs, and absence of feeding. In the experimental doses the median time of survival of daphnia was determined (Table 1.)

Table 1

Median time of survival of daphnia in different concentrations of aniline.

Concentration, mg/l	LT_{50}	Concentration mg/l	LT_{50}
10	10 hours	0.8	4 - 5 days
8	12 hours	.6	6 days
6	1 day	.4	8 days
4	1.5 days	.2	9 days
2	2 days	.1	-
1	3.5 days		

In a concentration of 0.1 mg/l the median time of survival was not determined, as extrapolation was remote and uncertain.

For chronic experiments we tested doses of aniline in mg/l: 0.08, 0.07, 0.06, 0.05, 0.04, 0.03, 0.02, 0.01 and control. For the experiments a 1% solution of the experimental substance was used. The length of the experiment was 21 days.

In the first four concentrations death of 30% of daphnia took place in 14, 15 and 16 days. In dead individuals the index of fullness of the gut equalled 2 (i.e. the contents fill less than half the gut). The colouring of the body was turbid-yellow (2M point). The appearance of young was recorded only on the 10th day (only a few examples), but in the control numerous young appeared on the 8th day.

In the next two doses (0.04 and 0.03 mg/l) the general state of the animals and the relationship to food during the experiment were as usual. However, we noted a decrease of the biomass of 2 times in comparison with the control. In 20% of daphnia the index of fulness of the gut equalled 2. The remaining indicators were similar to the control.

At doses of 0.02 and 0.01 mg/l the index of fullness of the gut equalled 4 - 5. The quantity of emerging young from 40 to 50 specimens was as in the control. The colouring of the body and the growth of the organisms were similar to the control. A. Tauson says (3) that of the two organisms (Daphnia and Cyclops) Daphnia appears less tolerant as regards aniline than Cyclops. In a dilution of 1/200 Daphnia lives 66 minutes, Cyclops 7 hours.

Thus a concentration of 0.02 mg/l is taken as the permissible concentration of aniline.

Summary.

Concentrations of aniline from 5000 to 0.1 mg/l appear acutely lethal.

The disturbance of feeding, reproduction, the disorganization of the nervous system, speak of the toxicity of the substance.

The proposed permissible concentration of aniline is 0.02 mg/l.

Literature

1. Lesnikov L.A. (1965). Influence of pollution on plankton and benthos of Perm (Kamsk) reservoir. Izvestiya GosNIORKH, 60.

2. Lesnikov, L.A. (1967). Daphnia as a test-organism in the degree and character of the influence of waste waters on fish farm waters. Leningrad.

3. Tauson, A.O. (1947). Toxic effects of different components of waste waters on fish and some invertebrates. Uch.Zap. Molotovks.Univ. 6, 1

Notice

Please note that these translations were produced to assist the scientific staff of the FBA (Freshwater Biological Association) in their research. These translations were done by scientific staff with relevant language skills and not by professional translators.